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ABSTRACT

This description of microcomputer use in schools within the East Texas School Study Council (ETSSC), a professional organization of 80 school districts, is based on 279 responses (66%) to a survey of 422 elementary and secondary school principals. Topics addressed include hardware and software available for educational use, microcomputing applications in education, the role of administrators in integrating microcomputers into schools, computer literacy of school personnel, and training necessary for school personnel. Separate tables display responses for each survey questionnaire item. Findings reported indicate that microcomputers, peripheral equipment, and software are available in all student enrollment ranges and school levels; the personnel in schools with microcomputers apparently consider microcomputers a long-term investment; microcomputer software is usually selected by the teacher or by the teacher and the principal; most principals do not use a microcomputer; school personnel use microcomputers for varied purposes; and microcomputers are used in a variety of instructional programs. A 38-item reference list and recommendations for both practitioners and researchers are included. (LMM)

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# The Uses of Microcomputers in the Public Schools within the East Texas School Study Council

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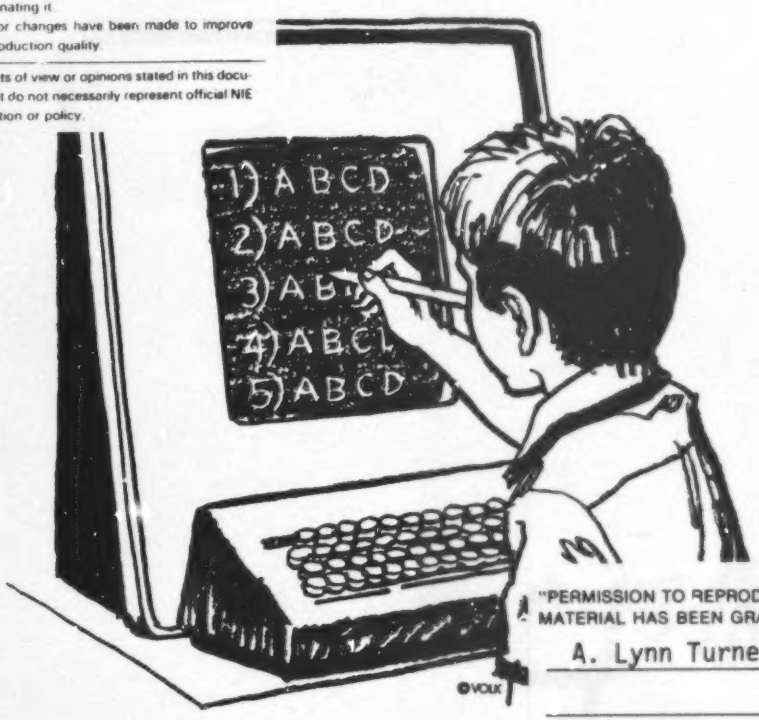


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## Chapter 1

## INTRODUCTION

The demands on teachers and administrators of educational institutions have increased during the past few decades. Some of the factors that have caused this increase are the following: larger schools, broader curriculum, more specialized instructional areas, legislation demanding more accountability, and, in general, a need to demonstrate well-planned and well-managed public school systems (Temple, 1973:99).

Teachers and administrators have found it necessary to make decisions based on inadequate or inaccurate information. Because of inadequate information systems, many school personnel have found the decision-making process difficult; therefore, there is a need to develop a better information-processing system to be used within the school systems. Several school districts have already purchased or contracted to use mainframe computer time to assist in the processing of information. However, many school districts have found it difficult to justify the cost involved in contracting their computer needs or purchasing a mainframe computer and employing the personnel required to operate it (Mondy, 1979:52-56).

Microcomputers offer another option to the much more expensive and larger mainframe computer. Microcomputers are portable, less expensive, and powerful. Managers in business and industry have already realized the value of using microcomputers (Kearsley, Hunter, and Hillelsohn, 1982:9). According to Kearsley, Hunter, and Hillelsohn (1982:9) in *Educational Technology*, "thousands of managers in all types of organizations have acquired and are using microcomputers to assist . . . " them in performing their daily management activities. They described typical workshops designed to provide managers with an understanding of how microcomputers could be used to improve their job productivity, to introduce small business owners to the use of microcomputers, and to train managers in computer-based training (Kearsley, Hunter, and Hillelsohn, 1982:9).

The hardware used in these workshops could be purchased off the shelf, and no assistance from the data processing departments would be necessary. The workshops did not teach anything about the internal workings, hardware, software, or even computer languages. The focus of the workshops was to provide the minimum of information necessary to actually use the system (Kearsley, Hunter, and Hillelsohn, 1982:9).

Integrating microcomputers into the public schools will take an all out effort from everyone, especially the central and building administrators. According to Cutts and others (1982:55), it is important for educators in leadership positions to gain microliteracy. Cutts and others (1982:55) stated that only the building administrators can provide leadership in ". . . explaining to parents, teachers and board members the technological and societal changes that improve the school curricula and proposing educational responses."

As related by Corbett and others (1982:111) a study conducted in the spring of 1981 in San Diego County, California, produced some interested findings. Of the 580 microcomputers used in the schools, four principals had a microcomputer in his/her office and made use of it. Corbett and others (1982:111) stated there was a clear implication that "school administrators are not into microcomputers." In the same article, Corbett and others (1982:111) continued, "The most important individual influencing the rate of change and/or introduction of innovation in a school is the principal." The research would suggest that public school administrators may not be using microcomputers in their jobs or even may not be prepared to provide the leadership needed to integrate the use of microcomputers into the public school systems. In addition, there may be some question as to the degree most administrators are microcomputer literate.

### Statement of the Problem

Microcomputers are being purchased by the schools at an ever increasing rate; however, according to Diem (1982b:4), there is increased concern over the lack of training of school personnel. The problem considered in this investigation was the type of microcomputer hardware and software available in the public school system, the extent to which microcomputers are being used in the public school system, and the degree to which school personnel are prepared to integrate microcomputers into the public school system.

## Purpose of the Study

The major purpose of this investigation was to present a description relating to microcomputers in schools within the East Texas School Study Council (ETSSC) in the following categories: hardware and software available, the degree that microcomputers are being used by school personnel, the degree of microcomputer literacy, the degree to which school personnel are prepared to integrate microcomputers into the schools, and the training needed by personnel. ETSSC is a professional organization of eighty school districts located in a thirty-eight county area of North and East Texas. Also considered were the size of the districts where the responding principals are employed and the level of school (elementary, middle, or secondary) which he/she was assigned.

Specific research questions formulated to aid in this study follow:

1. What types of microcomputer hardware and software are available in schools within the East Texas School Study Council (ETSSC) according to the average daily attendance (ADA);
2. What types of microputer hardware and software are available in different levels of schools within the ETSSC;
3. How are microcomputers used by personnel within these school districts according to the ADA;
4. How are microcomputers used by personnel in different levels of schools within these school districts;
5. What methods of funding are used to acquire microcomputers within these school districts according to the ADA;
6. What methods of funding are used to acquire microcomputers in different levels of schools within these school districts;
7. What is the degree of microcomputer literacy of personnel within these school districts according to the ADA;
8. What is the degree of microcomputer literacy of personnel in different levels of schools within these school districts;
9. What type of microcomputer inservice training or staff development program exists for personnel in these school districts according to the ADA;
10. What type of microcomputer inservice training or staff development is provided for personnel in different levels of school within these school districts;
11. What type of additional microcomputer training is needed by personnel in these school districts according to ADA;
12. What additional microcomputer training is needed by school personnel in different levels of schools within these school districts.

## Significance of the Study

The first computer age transformed society; however, it had little effect on the public school system. The technology was inappropriate for schools, and teachers were not prepared. "The second computer age—the microelectronic age—is what educational leaders have been waiting for: microcomputers that are small, cheap, portable, easy-to-use, and powerful" (Winkle and Mathews, 1982:314). However, Becker (1982:51) reported that even if microcomputers could expand the school curriculum and improve instruction, ". . . most schools are not ready today to implement such changes on a widespread basis." Although computer-based instruction may not be possible to implement today, there are many activities that could be undertaken that would affect the use of computers in the educational process in the future.

Becker (1982:51) suggested school systems should make the staff members as computer literate as possible. In addition, according to Burke and Kaiser (1982:83):

> Microcomputers are invading the classroom and teacher training for effective use is needed now. School systems must commit time and money to ensure appropriate and effective use of microcomputers in the classroom.

Burke and Kaiser (1982:85) also indicated that courses offered by local universities are not the answer. Information is lost when a computer class is attended weekly with little hands-on experience available. However, a two-week summer camp lasting seven hours per day was highly recommended.

Becker (1982:48) stated that "microcomputers are being bought by schools at the rate of

about 50 percent increase per year." Becker (1982:48) projected, "by 1986 there will be only about three computers per school, or one for every eight classrooms." According to Grossnickle and Laird (1982:60), "microcomputers are being purchased by schools at an astonishing rate, and it is predicted that soon more than 100,000 microprocessors will be purchased by schools."

In 1975, 20,000 microcomputers were sold, compared with 290,000 in 1979. Of the 290,000 microcomputers sold in 1979, 45,000 (16 percent) were purchased by educators (Corbett and others, 1982:111). Microcomputers will find their way into the schools. However, the following questions will need to be addressed: (1) Will the decision makers in the public schools be ready for this challenge? (2) Will they be able to identify the best investment? (3) Will the administrators prove to be prepared to provide the leadership necessary? (4) What is the current status of microliteracy of teachers and administrators?

As microcomputers have become more affordable and have been recognized as an effective instructional and administrative tool, an increasing number of school administrators have been faced with many problems (Mondy, 1979:10). Administrators must decide how valuable microcomputers would be to their schools. In addition, it may be helpful to know how many other administrators in their regions are using microcomputers and the type of hardware, software, and courseware being by other schools in their areas.

A search of *Dissertation Abstracts* and *Current Index to Journals in Education* failed to disclose any comprehensive studies concerning the use of microcomputers by the personnel within the public schools in the East Texas School Study Council area. The following descriptors were used in an Educational Resources Information Center (ERIC) search: microcomputers, surveys, public schools, and administration. A few related studies were found; however, none were in Texas and none were on this subject.

## Method of Procedure

This investigation was designed to describe the microcomputer hardware and software available, the extent microcomputers were used by school personnel, and the degree to which school personnel were prepared to integrate microcomputers into the public schools within the East Texas School Study Council. Because of the rapid technological advancements, microcomputers have become more affordable; however, there continues to be a question as to the availability of microcomputers and how prepared school personnel are to integrate microcomputers into schools. This information could be collected best by a survey instrument.

The items on the survey instrument were constructed to provide answers to the research questions. A panel of ten experts was used to validate the survey instrument, and members were selected on the basis of three of the four following criteria: published articles and/or books on the use of microcomputers, conducted research or made presentations concerning microcomputers, employed as an admisistrator who used/uses or has microcomputers in his/her building, and served as a microcomputer consultant. Prospective panel members contacted in the fall of 1982 and the spring of 1983.

In March, 1983, the survey instrument was sent to the principals of the schools within the East Texas School Study Council. Each principal was asked to complete and return the survey instrument at his/her earliest convenience in the self-addressed, stamped envelope.

The data were tabulated, compiled, and synthesized using percentages. Numbers and percentages were also used to graph, chart, and display the data collected. The numbers and percentages were used to describe the data collected within levels of schools, ADA ranges, and total population.

The schools within the East Texas School Study Council were selected because one of the primary objectives of the ETSSC indicated an interest in research. In addition, the information gained from this study could assist East Texas State University or other universities in this area in developing more appropriate instruction for public school personnel concerning microcomputers.

## Definition of Terms

The following terms were defined for use in this study:

*Elementary school:* containing three of the following grades: kindergarten, one, two, three, four, five, and six.

*Hardware:* the physical equipment that makes up the computer or its peripheral equipment.

*High school:* containing at least two of the following grade levels; nine, ten, eleven, and twelve.

*Junior high or middle school:* containing at least two of the following grade levels: six, seven, eight, and nine.

*Microcomputer:* small enough to fit on a desk top and can perform most of the same instructions as the larger mainframe computers (Kelsh and Lindelow, 1982:9).

*Microcomputer literate:* awareness of, knowledge about, and programming experience with microcomputers.

*Software:* a set of instructions or routines (given to the computer) that directs the computer to act or react in a certain way.

## Chapter 2

## REVIEW OF RELATED LITERATURE

The purpose of this chapter is to review the literature related to microcomputers in the following categories: the type of hardware, software, and peripheral equipment available within the public schools; the degree to which microcomputers are being used by school personnel; and the role of school administrators necessary to integrate microcomputers into the public schools. In addition, microcomputer literacy and training necessary for school personnel are reviewed.

The library at East Texas State University, Commerce, Texas, was used primarily for the research. *Dissertation Abstracts, Current Index of Journals of Education,* and *Education Index* were included in the review. Among other sources included were the Education Resources Information Center (ERIC) and the Bibliographic Retrieval Services (BRS). The literature surveyed was divided in the following categories: (1) microcomputer hardware and software available for educational use, (2) overview of microcomputing applications in education, (3) role of the administrator in integrating microcomputers into schools, (4) computer literacy of school personnel, and (5) training necessary for school personnel.

### Microcomputer Hardware and Software

The purpose of this section is to review the microcomputer hardware and software. The categories discussed are developments of the computer; components of a microcomputer; improved technology and reduced cost; and selecting hardware and software.

#### Developments of the Computer

According to Shane (1982:404), the first digital computer was built in 1946 at the University of Pennsylvania. This computer cost half a million uninflated dollars, weighed thirty tons, had 18,500 special vacuum tubes, and required 130,000 watts to operate. Golden (1983:30-32) indicated that the Electronic Numerical Integrator and Calculator (ENIAC) improved computer speed by using vacuum tubes instead of electromechanical relays as its switches. However, ENIAC had a major shortcoming. The computer had to be manually rewired to perform different operations, which could take several days. In 1951, Sperry-Rand produced the first commercial computer (UNIVAX1) that used the standard input devices (keyboard or tape) to input the operating instructions. Within a few years, Bell Labs built the first transistorized computer. These computers were built with tangles of wire connecting each component. However, according to Golden (1983:32), it was "... realized that any number of transistors could be etched directly on a single piece of silicon. ..." Golden (1983:32) commented that such integrated circuits contained "... entire sections of a computer, for example, a logic circuit or memory register. The microchip was born."

Approximately ten years ago, the Intel Corporation of Santa Clara, California, made the real breakthrough that was the beginning of the silicon age. By 1980, the equivalent of sixty thousand to seventy thousand vacuum tubes could be put on a single chip. In addition, by 1981, a single chip could hold the equivalent of 750,000 vacuum tubes (Shane, 1982:304).

Corbett and others (1982:110) reported that "the Altair 8800, one of the first microcomputers introduced in 1975, sold for somewhere between $2,000 and $3,000." Newer microcomputers on the market that offer comparable capabilities are now available from $600 to $800. Corbett and others (1982:110) estimated, by 1983, comparable microcomputer would cost around $300.

#### Components of a Microcomputer

According to Douglas and Neights (1980:1), the four basic components of a computer are the input device, memory, Central Processing Unit (CPU), and output unit. The CPU is considered the brain that performs all operations and manipulates all information. The other components of the microcomputer only interact with the CPU.

### Improved Technology and Reduced Cost

The cost of microcomputers has been significantly reduced over the past few years. According to Becker (1982:46-47), the computer was once an expensive tool for space science and management of large corporations; however, in the near future, computers and computer-based telecommunication will be a part of the white collar jobs. Becker also wrote that any of the computer programs written for the Apple, Radio Shack, or other popular computers enable these microcomputers to become cost-effective devices or teaching machines to use for teaching basic mathematics and language skills to a general or remedial population.

### Selecting Hardware and Software

According to Faflick (1983:37), "Choosing a computer, like selecting a spouse, can be a daunting undertaking." Hundreds of nearly identical models are available; the packaging can be misleading; and once a choice is made, the buyer is stuck with the brand. Purchasing hardware and software is a major decision; therefore, school district personnel should be very careful while making these decisions. According to Frankel (1982:17), "too often, however, the micros appear before anyone has thought about how to use them or even which brand to buy."

Administrators who have a working knowledge of computers recognize that selecting the most appropriate model depends on how the microcomputer will be used. According to Hoover and Gould (1982:88), "Prior to purchasing any hardware or software, the school district should identify its needs. One approach to defining these needs is to talk with other administrators who are presently using microcomputers." Hoover and Gould (1982:88) continued that these needs may include the following:

1. Word/text processing (note terms are used interchangeably for purposes of discussion) for generating correspondence and reports.
2. Setting up a data base system to handle the storage and retrieval of information about students.
3. Scheduling students into classes and developing bus routes, especially at the secondary school level.

In addition, Frankel (1982:17) stated that the following are general uses for microcomputers in elementary schools:

1. Computer literacy. Students learn how to program the computer in basic language and learn about the various parts of the machine and how they work.
2. Drill and practice. Students drill and practice routine skills by solving problems in a variety of subjects.
3. Simulation. The computer enables students to see the possible effects of a decision on political, economic, or scientific events.
4. Computer games. Teachers use the games (not the kinds you see in video arcades) to add vitality to instruction in almost any subject.
5. Business applications. The micro can help school executives with correspondence, bookkeeping, attendance records, communications, file maintenance, word processing, mailing lists, and accounting programs.
6. Extracurricular and enrichment programs. Students who become especially proficient at using the microcomputer will discover activities that go beyond the normal student uses.

## Applications in Education

Since 1980, microcomputers have become more available and are powerful enough to have many applications by public school personnel. Many students already own microcomputers and have some knowledge as to how to use them. Parents are asking if the schools are going to teach their children how to use computers. In addition, parents, taxpayers, and board members are beginning to ask if the schools are going to take advantage of this new technology (Botterell, 1982:148).

Microcomputers which are small, inexpensive, user-friendly, and versatile, can serve as important tools for the school principal in the following areas: keeping financial records; recording enrollment figures, absences, and grades; providing ready access to information on current and past school progress for each student.

Corbett and others (1982:112) reported that although much has been written about instructional uses of micro Computer-Assisted Instruction (CAI), Computer-Managed Instruction (CMI), and Information Retrieval, little has been written about administrative uses of microcomputers at the school site. A recent review (Corbett and others, 1982:112) of administrative uses of microcomputers by secondary school principals in California found the following:

1. Attendance accounting,
2. Registration and scheduling,
3. Budgeting,
4. Testing, grading, reporting,
5. Time management,
6. School-based needs assessment studies,
7. Inventory control,
8. Cafeteria accounting,
9. Discipline problem accounting,
10. Newsletters, and
11. Word processing.

### The Role of the Administrator

Knezevich (1975:37-38) defined sixteen important functions in school administration: (1) anticipating, (2) orienting, (3) programming, (4) organizing, (5) staffing, (6) resourcing, (7) leading, (8) executing, (9) changing, (10) diagnosing-analyzing conflict, (11) deciding-resolving, (12) coordinating, (13) communicating, (14) politicking, (15) controlling, and (16) appraising. Several of these sixteen functions have been identified as being affected by the integration of microcomputers into the public schools.

According to Marshall (1982a:6), "Information is a basic requirement for good decision making." In the past decade of computer usage there has been a shift from availability of information to the selection of information. The administrator must decide what to do with the vast amount of information and how to formulate questions to get the most relevant information. This will require the school administrator to develop new skills in information retrieval and to increase rationality in decision making.

Many school districts subscribe to the philosophy that decisions should be decentralized or made at the lowest level possible. The information processing potential of the microcomputer will enhance the opportunities for information to be received and rational decisions to be made at the building level (Marshall, 1982a:7).

### Computer Literacy of School Personnel

Becker (1982:51) defined computer literacy as the "familiarity with the variety of instruction-related tasks that microcomputers can be expected to perform now or in the near future." Additionally, Becker (1982:51) offered the definition of:

> . . . giving teachers experience in using microcomputers for a variety of functions, including preparation and editing of textual material, test scoring and drill-and-practice.

However, Becker (1982:51) also recommended, for many teachers, "computer literacy should include acquiring the ability to write BASIC language programs on existing microcomputers and learning to teach computer programming."

The Human Resources Research Organization, as reported by Jennings (1982:9), defined computer literacy as "what a person needs to know about and to do with computers in order to function competently in our society."

Diem (1982a:20) reported that being computer literate was dependent on the population being served and the needs of that population considering the equipment the population will be

using or working with. Additionally, according to Diem (1982a:20), the "long-term goals of the institution providing the literacy training" must be considered. However, Bell (1982:171) stated that computer literacy should include areas such as the following:

> . . . history of computers, the nature of computers, communication with computers, types of computers, and peripheral hardware, capabilities and limitations of computers, computer uses, and programming skills.

### Training Needed by School Personnel

Diem (1982b:5) wrote, ". . . colleges and universities charged with pre and inservice teacher training need to display leadership roles." Moreover, this has not happened at the same pace as the placement of hardware within schools.

There are several types of training models that have been suggested for teacher educators, according to Diem (1982b:6). These models range from a series of courses and programs on computers developed and provided for college students training to become teachers to teachers and administrators taking two courses in computer science either at the preservice or inservice level. Diem (1982b:7-8) referred to these models as the following: (1) The General Education Course Work Model, (2) The Educational Technology Model, (3) The Integration/Application Model, (4) The Inservice/Certification Model, and (5) The Technology Follow-up Model.

## Chapter 3

## PRESENTATION AND ANALYSIS OF THE DATA

The major purpose of this study was to present a description related to microcomputers in schools within the East Texas School Study Council (ETSSC) in the following categories: hardware and software available, uses, funding, literacy, training provided, and additional training needed. Also considered was the average daily attendance (ADA) range of the school district in which each respondent was employed during the 1982-1983 school year and the level of school (elementary, middle or junior high, or high school) to which he/she was assigned.

The data gathered for this study were collected from the ETSSC Microcomputer Survey Instrument, which was completed and returned by 279 (66.11 percent) of the 422 principals within the ETSSC.

Questions from the survey instrument (Appendix B) are presented in this chapter along with tables analyzing the responses for each question. The major categories that have been examined relating to microcomputers in the schools within the ETSSC are the following: hardware and software available, uses, funding, literacy, training provided, and additional training needed. Also considered are the ADA range of the school district and the level of school in which the respondent was employed.

Each respondent was instructed to complete and return the entire questionnaire if his/her school had at least one microcomputer available. However, if there were no microcomputers available in his/her school, the respondent was instructed to omit questions four through seventeen and complete the remainder of the questionnaire.

Of the 422 principals within the ETSSC who were mailed survey instruments, 279 principals responded. Of the 279 principals who responded, the number and percent who were employed by districts within the three ADA ranges were the following: 60 (21.51 percent) in the 1 to 999 range, 82 (29.39 percent) in the 1,000 to 2,999 range, and 137 (49.10 percent) in the 3,000 and above range. In addition, of the 279 principals who responded, the number and percent that were assigned to the three levels of schools were the following: 150 (53.76 percent) in elementary schools, 54 (19.35 percent) in middle or junior high, 67 (24.01 percent) in high schools, and 8 (2.87 percent) other types of schools.

### Hardware and Software Available

Research question 1 asked, "What type of microcomputer hardware and software is available in schools within The East Texas School Study Council (ETSSC) according to the following average daily attendence (ADA) ranges: 0 to 999, 1,000 to 2,999, and 3,000 or more?" Research question 2 asked, "What type of microcomputer hardware and software is available in elementary, junior high or middle, and high schools withing the ETSSC?"

To collect data for these questions, principals were asked to indicate the following related to microcomputers in their buildings: Number of each brand and model, number of each brand and model in the appropriate internal memory range, and number of each brand and model that used each type of storage device. The principals were also asked to indicate the peripheral devices available, the sources of software, how they rated the software programs, who evaluated and selected software, and the degree to which efforts were made to ensure that the selected hardware and software supports the goals and objectives of the building and school district.

### Number of Microcomputers

Of the 279 principals surveyed, 89 responded to the question that asked the principals to indicate the number of microcomputers in their schools. There were 627 microcomputers reported within these schools. The number and percent of the schools with microcomputers within the three ADA ranges (Table 1) were the following: 101(16.11 percent) in the 1-999 range; 114 (18.18 percent) in the 1,000-2,999 range; and 412 (65.71 percent) in the 3,000 and over range.

**Table 1**
**Brands and Models of Microcomputers within the ADA Ranges**

| Brands and models | 1-999 N | 1-999 % | 1,000-2,999 N | 1,000-2,999 % | 3,000+ N | 3,000+ % | Total N | Total % |
|---|---|---|---|---|---|---|---|---|
| TRS 80 | | | | | | | | |
| Model I | 9 | 8.91 | 1 | 0.88 | 31 | 7.52 | 41 | 6.54 |
| Model II | 4 | 3.96 | 7 | 6.14 | 48 | 11.65 | 59 | 9.41 |
| Model III | 5 | 4.95 | 15 | 13.16 | 33 | 8.01 | 53 | 8.45 |
| Apple II | 44 | 43.56 | 63 | 55.26 | 197 | 47.82 | 304 | 48.48 |
| Commodore Pet | 30 | 29.70 | 22 | 19.30 | 62 | 15.05 | 114 | 18.18 |
| TI 99/4 or TI 99/4A | 0 | 0.00 | 4 | 3.51 | 10 | 2.43 | 14 | 2.23 |
| Other | 9 | 8.91 | 2 | 1.75 | 31 | 7.52 | 42 | 6.70 |
| Total Computers | 101 | 16.11 | 114 | 18.18 | 412 | 65.71 | 627 | 100.00 |

The number and percent of these schools with microcomputers within the levels of schools (Table 2) were the following: 174 (27.75 percent) in elementary schools; 85 (13.56 percent) in middle or junior high schools; and 368 (58.69 percent) in high schools.

**Brands of Microcomputers**

Of the 627 microcomputers reported within the eighty-nine schools, the number and percent of the brands and models of microcomputers (Table 1) were the following: TRS-80 Model I, 41 (6.54 percent); TRS-80 Model II, 59 (9.41 percent); TRS-80 Model III, 53 (8.45 percent);

**Table 2**
**Brands and Models of Microcomputers within the Levels of Schools**

| Brands and models | Elementary N | Elementary % | Middle N | Middle % | High School N | High School % | Total N | Total % |
|---|---|---|---|---|---|---|---|---|
| TRS 80 | | | | | | | | |
| Model I | 8 | 4.60 | 4 | 4.71 | 29 | 7.88 | 41 | 6.54 |
| Model II | 0 | 0.00 | 3 | 3.53 | 56 | 15.22 | 59 | 9.41 |
| Model III | 4 | 2.30 | 0 | 0.00 | 49 | 13.32 | 53 | 8.45 |
| Apple II | 110 | 63.22 | 47 | 55.29 | 147 | 39.95 | 304 | 48.48 |
| Commodore Pet | 24 | 13.79 | 30 | 35.29 | 60 | 16.30 | 114 | 18.18 |
| TI 99/4 or TI 99/4A | 14 | 8.05 | 0 | 0.00 | 0 | 0.00 | 14 | 2.23 |
| Other | 14 | 8.05 | 1 | 1.18 | 27 | 7.34 | 42 | 6.70 |
| Total computers | 174 | 27.75 | 85 | 13.56 | 368 | 58.69 | 627 | 100.00 |

Apple II, 304 (48.48 percent); Pet Commodore, 114 (18.18 percent); TI 99/4 or TI 99/4A, 14 (2.23 percent); and other brands and models, 42 (6.70 percent). The other brands and models included Apple III, IBM (PC), and Commodore 64.

**Internal Memory**

Of the 279 principals who responded, 89 reported that 627 microcomputers were available within their schools. The principals were asked to indicate the number of microcomputers in their schools in the appropriate internal memory ranges. The internal memory ranges were from 4K to 16K, 32K to 48K, and 64K and above. The number and percent of the microcomputers in these ranges (Table 3) were the following: 97 (15.47 percent) from the 4K to 16K range; 376 (59.97 percent) from the 32K to 48K range; and 154 (24.56 percent) from the 64K or above range.

**Table 3**
**Internal Memory of Microcomputers within the Levels of Schools**

| Memory range | Elementary | | Middle | | High School | | Total | |
|---|---|---|---|---|---|---|---|---|
| | N | % | N | % | N | % | N | % |
| 4-16K | 31 | 17.82 | 7 | 8.24 | 59 | 16.02 | 97 | 15.47 |
| 32-48K | 116 | 66.67 | 59 | 69.41 | 201 | 54.62 | 376 | 59.97 |
| 64K+ | 27 | 15.52 | 19 | 22.35 | 108 | 29.35 | 154 | 24.56 |
| Total computers | 174 | 27.75 | 85 | 13.56 | 368 | 58.69 | 627 | 100.00 |

**Storage Devices**

The principals were asked to indicate the storage devices used by the microcomputers within their schools. Of the storage devices used by the 627 microcomputers, 482 (72.87 percent) were floppy diskettes and 145 (23.13 percent) were cassettes (Table 4).

**Table 4**
**Storage Devices of Microcomputers within the Levels of Schools**

| Storage device | Elementary | | Middle | | High School | | Total | |
|---|---|---|---|---|---|---|---|---|
| | N | % | N | % | N | % | N | % |
| Floppy diskettes | 138 | 79.31 | 68 | 80.00 | 276 | 75.00 | 482 | 76.87 |
| Cassettes | 36 | 20.69 | 17 | 20.00 | 92 | 25.00 | 145 | 23.13 |
| Total | 101 | 16.11 | 114 | 18.18 | 41[illegible] | 65.71 | 627 | 100.00 |

**Peripheral Devices**

Of the 108 principals who responded to this section of the survey instrument, 90 indicated their schools had at least one microcomputer peripheral device. Of the schools with microcomputers available, the number and percent of these schools and the type of microcomputer peripheral devices available (Table 5) were the following: 71 (65.74 percent) schools had a printer, 7 (6.48 percent) schools had a telephone connection (modem), no schools reported the availability of a graphics tablet, 3 (2.78 percent) schools had a card or mark sense reader, and 4 (3.70 percent) schools had other types of peripheral devices.

**Table 5**
**Peripheral Devices of Microcomputers within the Levels of Schools**

| Peripheral device | Elementary | | Middle | | High School | | Total | |
|---|---|---|---|---|---|---|---|---|
| | N | % | N | % | N | % | N | % |
| Printer | 17 | 50.00 | 16 | 80.00 | 38 | 70.37 | 71 | 65.74 |
| Network | 2 | 5.88 | 0 | 0.00 | 5 | 9.26 | 7 | 6.48 |
| Modem | 1 | 2.94 | 0 | 0.00 | 6 | 11.11 | 7 | 6.48 |
| Graphics tablet | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| Card reader | 1 | 2.94 | 1 | 5.00 | 1 | 1.85 | 3 | 2.78 |
| Other | 1 | 2.94 | 0 | 0.00 | 3 | 5.56 | 4 | 3.70 |
| Total schools | 34 | 31.48 | 20 | 18.52 | 54 | 50.00 | 108 | 100.00 |

**Table 6**
**Sources of Software for Microcomputers within the Levels of Schools**

| Sources of software | Elementary | | Middle | | High School | | Total | |
|---|---|---|---|---|---|---|---|---|
| | N | % | N | % | N | % | N | % |
| Computer vendor | 18 | 50.00 | 12 | 70.59 | 42 | 50.93 | 72 | 66.67 |
| Mail order | 5 | 13.89 | 2 | 11.76 | 14 | 25.45 | 21 | 19.44 |
| Educational publisher | 13 | 36.11 | 9 | 52.94 | 21 | 38.18 | 43 | 39.81 |
| In-house | 6 | 16.67 | 6 | 16.67 | 16 | 29.09 | 28 | 25.93 |
| User group | 4 | 11.11 | 4 | 11.11 | 11 | 20.00 | 19 | 17.59 |
| Contracted development | 0 | 0.00 | 1 | 5.88 | 5 | 9.09 | 6 | 5.56 |
| Independent vendor | 16 | 44.44 | 5 | 29.41 | 14 | 25.45 | 35 | 32.41 |
| Other | 7 | 19.44 | 1 | 5.88 | 6 | 10.91 | 14 | 12.96 |
| Total schools | 36 | 33.33 | 17 | 15.74 | 55 | 50.93 | 108 | 100.00 |

**Sources of Software**

Of the 279 principals surveyed, there were 108 principals who responded to the question related to the source of software acquired by the personnel in the schools within the East Texas School Study Council (ETSSC). These schools acquired software from the following sources (Table 6): 72 (66.67 percent) from the computer vendor; 21 (10.44 percent) from a mail order house; 43 (39.81 percent) from an educational publisher; 28 (25.93 percent) through an in-house programer; 19 (17.59 percent) through a user group; 6 (5.56 percent) through contracted development; 35 (32.41 percent) from an independent vendor; and 14 (12.96 percent) from other sources.

**Rating of Software Programs**

Of the 270 principals surveyed, there were 117 who responded to the question on rating computer software programs. Of these 117 principals, the results of how the principals rated the software were the following (Table 7): majority are very good, 51 (43.59 percent); generally acceptable, 38 (32.48 percent); majority are very poor, 4 (3.42 percent); too few to rate, 16 (13.68 percent); and did not know, 8 (6.84 percent).

**Table 7**
**Ratings of Software for Microcomputers within the Levels of Schools**

| Software ratings | Elementary | | Middle | | High School | | Total | |
|---|---|---|---|---|---|---|---|---|
| | N | % | N | % | N | % | N | % |
| Very good | 20 | 51.28 | 4 | 20.00 | 25 | 44.67 | 51 | 43.59 |
| Acceptable | 10 | 25.64 | 9 | 45.00 | 18 | 32.14 | 38 | 32.48 |
| Very poor | 1 | 2.56 | 0 | 0.00 | 2 | 3.57 | 4 | 3.42 |
| Too few to rank | 6 | 15.38 | 6 | 30.00 | 4 | 7.14 | 16 | 13.68 |
| Did not know | 2 | 5.13 | 1 | 5.00 | 4 | 7.14 | 8 | 6.84 |
| Total schools | 39 | 33.33 | 20 | 17.09 | 56 | 47.86 | 117 | 100.00 |

**Evaluation and Selection of Microcomputer Software**

Of the 279 principals surveyed, there were 108 who responded to the question that asked who evaluated and selected microcomputer software. Of the 108 principals who responded, the results of who evaluates and selects software were the following (Table 8): teacher who uses, 44 (40.74 percent); teacher and principal, 50 (46.30 percent); district committee, 18 (16.67 percent); building committee, 1 (0.93 percent); and other, 5 (4.63 percent).

**Table 8**
**Selection and Evaluation of Software for Microcomputers within the Levels of Schools**

| Selection and evaluation | Elementary | | Middle | | High School | | Total | |
|---|---|---|---|---|---|---|---|---|
| | N | % | N | % | N | % | N | % |
| Teacher | 14 | 41.18 | 12 | 60.00 | 18 | 33.33 | 44 | 40.74 |
| Teacher and principal | 19 | 55.88 | 10 | 50.00 | 21 | 38.89 | 50 | 46.30 |
| District committee | 6 | 17.65 | 6 | 30.00 | 6 | 11.11 | 18 | 16.67 |
| Building committee | 1 | 2.94 | 0 | 0.00 | 0 | 0.00 | 1 | 0.93 |
| Other | 1 | 2.94 | 3 | 15.00 | 1 | 1.85 | 5 | 4.63 |
| Total schools | 34 | 31.48 | 20 | 18.52 | 54 | 50.00 | 108 | 100.00 |

**Hardware and Software Support of Goals of Schools**

Of the 279 principals who were surveyed, there were 116 who responded to the questionnaire. The data showed the degree that efforts have been made to ensure that microcomputer hardware and software selected support the goals and objectives of the school district and building were the following (Table 9): 59 (50.86 percent), almost always; 39 (33.62 percent), usually; 10 (8.62 percent), sometimes; 1 (0.86 percent), seldom; and 7 (6.03 percent), almost never.

**Table 9**
**Hardware and Software Support of Goals and Objectives within the Levels of Schools**

| Goals and objectives supported | Elementary | | Middle | | High School | | Total | |
|---|---|---|---|---|---|---|---|---|
| | N | % | N | % | N | % | N | % |
| Almost always | 23 | 58.97 | 7 | 35.00 | 25 | 48.08 | 59 | 50.86 |
| Usually | 9 | 23.07 | 10 | 50.00 | 20 | 38.47 | 39 | 33.62 |
| Sometimes | 3 | 7.69 | 1 | 5.00 | 5 | 9.61 | 10 | 8.62 |
| Seldom | 0 | 0.00 | 1 | 5.00 | 0 | 0.00 | 1 | 0.86 |
| Almost never | 4 | 10.26 | 1 | 5.00 | 2 | 3.85 | 7 | 6.03 |
| Total schools | 39 | 33.62 | 20 | 17.24 | 52 | 47.41 | 116 | 100.00 |

The microcomputer hardware and software should support the goals and objectives of the school district and building. The data showed nearly ninety percent of the respondents who selected hardward or software almost always o. usually considered these goals.

**Table 10**
**Use of Microcomupters by Principals within the Levels of Schools**

| Uses by principals | Elementary | | Middle | | High School | | Total | |
|---|---|---|---|---|---|---|---|---|
| | N | % | N | % | N | % | N | % |
| Word processing | 3 | 8.57 | 2 | 10.53 | 8 | 15.09 | 13 | 12.15 |
| Inventory | 3 | 8.57 | 2 | 10.53 | 7 | 13.21 | 12 | 11.21 |
| Student data | 4 | 11.43 | 4 | 21.05 | 13 | 24.53 | 21 | 19.63 |
| Grade recording | 1 | 2.86 | 3 | 15.79 | 14 | 26.42 | 18 | 16.82 |
| Student scheduling | 1 | 2.86 | 1 | 5.26 | 10 | 18.87 | 12 | 11.21 |
| Accounting | 2 | 5.71 | 2 | 10.53 | 7 | 13.21 | 11 | 10.28 |
| Not used | 29 | 82.86 | 9 | 47.37 | 28 | 52.83 | 66 | 61.68 |
| Other | 1 | 2.86 | 2 | 10.53 | 4 | 7.55 | 7 | 6.54 |
| Total principals | 35 | 32.71 | 19 | 17.76 | 53 | 49.53 | 107 | 100.00 |

## Use of Microcomputers

Research question 3 asked, "How are microcomputers used by personnel within these school districts according to the following ADA ranges: 0 to 999, 1,000 to 2,999, and 3,000 or more?" Research question 4 asked, "How are microcomputers used by personnel in elementary, junior high or middle, and high schools within these school districts?"

### Use of Microcomputer by Personnel

There were 106 principals who responded to the question that asked how microcomputers were used by personnel in their buildings. The data showed the personnel in the school buildings used microcomputers (Table 11) for the following purposes: staff computer literacy, 43 (40.57 percent); student computer literacy, 77 (72.64 percent); library, 14 (13.21 percent); drill and practice, 68 (64.15 percent); tutorial, 54 (50.94 percent); simulation, 27 (25.47 percent); did not use their microcomputers, 2 (1.89 percent); and for other purposes, 5 (4.72 percent).

**Table 11**
**Use of Microcomupters in Buildings within the Levels of Schools**

| Uses in building | Elementary | | Middle | | High School | | Total | |
|---|---|---|---|---|---|---|---|---|
| | N | % | N | % | N | % | N | % |
| Staff computer literacy | 15 | 41.67 | 6 | 33.33 | 22 | 42.31 | 43 | 40.57 |
| Student computer literacy | 22 | 61.11 | 12 | 66.67 | 43 | 82.69 | 77 | 72.64 |
| Library | 6 | 16.67 | 1 | 5.56 | 7 | 13.46 | 14 | 13.21 |
| Drill and practice | 27 | 75.00 | 11 | 61.11 | 30 | 57.69 | 68 | 64.15 |
| Tutorial | 24 | 66.67 | 6 | 33.33 | 24 | 46.15 | 54 | 50.94 |
| Simulation | 7 | 19.44 | 1 | 5.56 | 19 | 36.54 | 27 | 25.47 |
| Not used | 1 | 2.78 | 0 | 0.00 | 1 | 1.92 | 2 | 1.89 |
| Other | 1 | 2.78 | 1 | 5.56 | 3 | 5.77 | 5 | 4.72 |
| Total schools | 36 | 33.96 | 18 | 16.98 | 52 | 49.06 | 106 | 100.00 |

Less than one-half of the schools surveyed had a microcomputer available. However, of those schools that did have a microcomputer available, they were being used for several purposes. Due to the microcomputers being used for several purposes, they appear to be a versatile tool in an educational setting. In addition, only some of the teachers appeared to be interested in using microcomputers; however, those teachers using microcomputers were finding a variety of uses.

### Use of Microcomputer In Instructional Programs

The principals were asked to indicate instructional programs in which microcomputers were used in their schools. Of the 108 principals who responded, the number and percent of schools that used microcomputers in various instructional programs (Table 12) were: language arts, 33 (32.35 percent); special education, 33 (32.35 percent); gifted, 34 (33.33 percent); federal and

state compensatory, 16 (14.81 percent); math, 81 (79.41 percent); business, 22 (21.57 percent); vocational education, 23 (22.55 percent); did not use their microcomputers, 9 (8.82 percent); and used for other purposes, 14 (13.73 percent).

**Table 12**
**Use of Microcomupters in Instructional Programs the Levels of Schools**

| Uses in program | Elementary | | Middle | | High School | | Total | |
|---|---|---|---|---|---|---|---|---|
| | N | % | N | % | N | % | N | % |
| Language arts | 19 | 54.29 | 6 | 35.29 | 8 | 14.29 | 33 | 32.35 |
| Special education | 13 | 37.14 | 5 | 29.41 | 15 | 26.79 | 33 | 32.35 |
| Gifted | 13 | 37.14 | 10 | 58.82 | 11 | 19.64 | 34 | 33.33 |
| Compensatory | 9 | 25.71 | 0 | 0.00 | 7 | 12.50 | 16 | 14.81 |
| Math | 25 | 71.43 | 12 | 70.59 | 44 | 78.57 | 81 | 79.41 |
| Business | 1 | 2.86 | 0 | 0.00 | 21 | 37.50 | 22 | 21.57 |
| Vocational | 0 | 0.00 | 2 | 11.76 | 21 | 37.50 | 23 | 22.55 |
| Not Used | 4 | 11.43 | 2 | 11.76 | 3 | 5.36 | 9 | 8.82 |
| Other | 3 | 8.57 | 0 | 0.00 | 11 | 19.64 | 14 | 13.73 |
| Total schools | 35 | 32.41 | 17 | 15.74 | 56 | 51.85 | 108 | 100.00 |

**Instructional Arrangement**

The principals were asked to identify the instuctional arrangements that were used with microcomputers within their schools. Of the 109 principals who responded, the data showed that microcomputers were used in these schools (Table 13) with the following instructional arrangements: lab, 38 (34.86 percent); classroom, 66 (60.55 percent); media center, 27 (24.77 percent); and other, 6 (5.50 percent).

**Table 13**
**Instructional Arrangements for Microcomputers within the Levels of Schools**

| Instructional arrangement | Elementary | | Middle | | High School | | Total | |
|---|---|---|---|---|---|---|---|---|
| | N | % | N | % | N | % | N | % |
| Lab | 7 | 19.44 | 5 | 27.78 | 26 | 47.27 | 38 | 34.86 |
| Classroom | 15 | 41.67 | 14 | 77.78 | 37 | 67.27 | 66 | 60.55 |
| Media center/ library | 18 | 50.00 | 0 | 0.00 | 9 | 16.36 | 27 | 24.77 |
| Other | 4 | 11.11 | 0 | 0.00 | 2 | 3.64 | 6 | 5.50 |
| Total schools | 36 | 33.03 | 18 | 16.51 | 55 | 50.46 | 109 | 100.00 |

More schools used microcomputers in a classroom setting than in a lab setting. However, the primary advantage of using a lab setting for microcomputer instruction is the ability to network several microcomputers together. Therefore, those schools that used a lab setting tended to have more microcomputers available that those schools that used a classroom setting.

### Scheduling Microcomputers

The principals were asked to identify which methods were used to schedule microcomputers within their buildings. Of the 109 principals who responded to this question, the number, percent of schools, and the methods used to schedule microcomputers (Table 14) were the following: self-contained classroom, 41 (37.61 percent); departmentalized, 20 (18.35 percent); lab, 34 (31.19 percent); check out as needed from a central location, 13 (11.93 percent); checked out on a regularly scheduled or rotating basis, 12 (11.01 percent); and other methods, 13 (11.93 percent).

**Table 14**
**Scheduling Microcomputers within the Levels of Schools**

| Methods of scheduling | Elementary | | Middle | | High School | | Total | |
|---|---|---|---|---|---|---|---|---|
| | N | % | N | % | N | % | N | % |
| Self contained | 6 | 16.67 | 4 | 22.22 | 31 | 56.36 | 41 | 37.61 |
| Department | 4 | 11.11 | 5 | 27.78 | 11 | 20.00 | 20 | 18.35 |
| Lab | 10 | 27.78 | 6 | 33.33 | 18 | 32.73 | 34 | 31.19 |
| Checked out as needed | 6 | 16.67 | 0 | 0.00 | 7 | 12.73 | 7 | 12.73 |
| Checked out regularly | 7 | 19.44 | 2 | 11.11 | 3 | 5.45 | 12 | 11.01 |
| Other | 7 | 19.44 | 2 | 11.11 | 4 | 7.27 | 13 | 11.93 |
| Total schools | 36 | 33.03 | 18 | 16.51 | 55 | 50.46 | 109 | 100.00 |

### Funding Microcomputers

Research question 5 asked, "What are the methods of funding used to acquire microcomputers within these school districts according to the following ADA ranges: 0 to 999, 1,000 to 2,999, and 3,000 or more?" Research question 6 asked, "What are the methods of funding used to acquire microcomputers in elementary, junior high or middle, and high schools within these school districts?" To collect data for these questions, principals were asked to respond to questions related to the sources of funding for microcomputers, the percent of the equipment budget in their buildings that was spent on microcomputers, and what contractual arrangement was used by their school districts or buildings to acquire microcomputers.

### Sources of Funding

Of the 279 principals within the ETSSC who were surveyed, there were 108 who responded to the question that asked what sources were used to fund microcomputers. The data showed the number and percent of these schools and the funding sources used to acquired microcomputer hardware and software (Table 15) were the following: state, 9 (8.82 percent); Parent Teacher

Organization or Parent Teacher Association, 17 (16.67 percent); vocational, 12 (11.76 percent); local, 73 (71.57 percent); grants, 10 (9.80 percent); campus activity fund, 16 (15.69 percent); compensatory, 25 (24.51 percent); special education, 10 (9.80 percent); and other sources, 5 (4.90 percent).

**Table 15**
**Sources of Funding Microcomputers within the Levels of Schools**

| Funding resources | Elementary | | Middle | | High School | | Total | |
|---|---|---|---|---|---|---|---|---|
| | N | % | N | % | N | % | N | % |
| State | 1 | 2.78 | 0 | 0.00 | 8 | 16.33 | 9 | 8.82 |
| PTO/PTA | 12 | 33.33 | 3 | 17.65 | 2 | 4.08 | 17 | 16.67 |
| Vocational | 1 | 2.78 | 0 | 0.00 | 11 | 22.45 | 12 | 11.76 |
| Local | 19 | 52.78 | 10 | 58.82 | 44 | 89.80 | 73 | 71.57 |
| Grants | 3 | 8.33 | 1 | 5.88 | 6 | 12.24 | 10 | 9.80 |
| Campus activity | 7 | 19.44 | 4 | 23.53 | 5 | 10.20 | 16 | 15.69 |
| Compensatory | 9 | 25.00 | 5 | 29.41 | 11 | 22.45 | 25 | 24.51 |
| Special education | 5 | 13.89 | 1 | 5.88 | 4 | 8.16 | 10 | 9.80 |
| Other | 3 | 8.33 | 2 | 11.76 | 0 | 0.00 | 5 | 4.90 |
| Total schools | 36 | 33.33 | 17 | 15.74 | 55 | 50.93 | 108 | 100.00 |

**Contractual Arrangements Used to Acquire Microcomputer Equipment**

Of the 279 principals within the ETSSC who were surveyed, 105 responded to the question that asked what contractual arrangements were used to acquire microcomputer equipment. The data showed the number and percent of these schools and contractual arrangements (Table 16) were the following: purchase, 98 (93.33 percent); rent, 2 (1.90 percent); lease/purchase, 3 (2.86 percnet); gift, 2 (1.90 percent); and other, 1 (0.95 percent).

**Table 16**
**Methods Used to Acquire Microcomputer Equipment within the Levels of Schools**

| Methods to acquire equipment | Elementary | | Middle | | High School | | Total | |
|---|---|---|---|---|---|---|---|---|
| | N | % | N | % | N | % | N | % |
| Purchase | 34 | 94.44 | 15 | 88.24 | 49 | 94.23 | 98 | 93.33 |
| Rental | 0 | 0.00 | 0 | 0.00 | 2 | 3.5 | 2 | 1.90 |
| Lease/ purchase | 1 | 2.78 | 1 | 5.88 | 1 | 1.92 | 3 | 2.86 |
| Gift | 1 | 2.78 | 1 | 5.88 | 0 | 0.00 | 2 | 1.90 |
| Other | 1 | 2.78 | 0 | 0.00 | 0 | 0.00 | 1 | 0.95 |
| Total schools | 36 | 34.29 | 17 | 16.19 | 52 | 49.52 | 105 | 100.00 |

Over ninety-three percent of the microcomputers were purchased. Since these microcomputers were purchased with money that was primarily from local sources, it appears that rich school districts will be more likely to have more microcomputers available than poor school districts. Since House Bill 246 requires instruction in computer literacy, almost all school districts will have some microcomputers available in order to be in compliance with the state curriculum. Possible alternative funding sources and alternative methods to acquire microcomputers will be explored.

### Degree of Microcomputer Literacy

Research question 7 asked, "What is the degree of microcomputer literacy of personnel within these school districts according to the following ADA ranges: 0 to 999, 1,000 to 2,999, and 3,000 or more?" Research question 8 asked, "What is the degree of microcomputer literacy of personnel in elementary, junior high or middle, and high schools within these school districts?" To collect data for these questions, prinicipals were asked to respond to the following questions related to microcomputer literacy: (1) How many clock hours did the principals use a microcomputer? (2) How many college or university classes concerning microcomputers had the prinicipals taken? (3) What percent of the personnel had taken one, two, or three or more college or university classes concerning microcomputers? (4) How many clock hours of microcomputer training did the principals receive, not including college classes or school district inservice training?

### Clock Hours of Use of Microcomputer by Principal

Of the 279 principals who were surveyed, all responded to the question that asked how many clock hours the principals had used a microcomputer. The number of principals, percent of principals, and number of clock hours they have used a microcomputer (Table 17) were as follows: no hours, 136 (48.75 percent); 1-5 hours, 49 (17.56 percent); 6-20 hours, 40 (14.34 percent); 21-60 hours, 24 (8.60 percent); and 61 or more hours, 30 (10.75 percent).

**Table 17**
**Number of Clock Hours Principals Used Microcomputer within the Levels of Schools**

| Number of clock hours | Elementary | | Middle | | High School | | Total | |
|---|---|---|---|---|---|---|---|---|
| | N | % | N | % | N | % | N | % |
| No hours | 73 | 48.67 | 27 | 50.00 | 31 | 46.27 | 136 | 48.75 |
| 1-5 hours | 23 | 15.33 | 13 | 24.07 | 13 | 19.40 | 49 | 17.56 |
| 6-20 hours | 25 | 16.67 | 7 | 12.96 | 7 | 10.45 | 40 | 14.34 |
| 21-60 hours | 16 | 10.67 | 3 | 5.56 | 5 | 7.46 | 24 | 8.60 |
| 61 or more hours | 13 | 8.67 | 4 | 7.41 | 11 | 16.42 | 30 | 10.75 |
| Total schools | 150 | 33.76 | 54 | 19.35 | 67 | 24.01 | 279 | 100.00 |

**College or University Classes Taken by Principals**

All 279 principals responded to the question that asked how many college or university classes the principals had taken. The data showed the number and percent of principals and the number of college or university classes they had taken (Table 18) were the following: no class, 204 (69.53 percent); 1 partial class, 22 (7.89 percent); 1 class, 25 (8.96 percent); 2-3 clases, 27 (9.86 percent); and 4 or more classes, 1 (0.36 percent).

**Table 18**
**Number of Microcomputer College or University Classes Taken by Principals According to Levels of Schools**

| Number of classes | Elementary | | Middle | | High School | | Total | |
|---|---|---|---|---|---|---|---|---|
| | N | % | N | % | N | % | N | % |
| No class | 115 | 76.67 | 42 | 77.78 | 41 | 61.19 | 204 | 69.53 |
| 1 partial class | 9 | 6.00 | 4 | 7.41 | 8 | 11.94 | 22 | 7.87 |
| 1 class | 14 | 9.33 | 3 | 5.55 | 8 | 11.94 | 25 | 8.96 |
| 2-3 classes | 12 | 8.00 | 4 | 7.41 | 10 | 14.93 | 27 | 9.68 |
| 4 or more classes | C | 0.00 | 1 | 1.85 | 0 | 0.00 | 1 | 0.36 |
| Total schools | 150 | 53.76 | 54 | 19.35 | 67 | 24.01 | 279 | 100.00 |

**Staff Development (Inservice Training) Received**

Research question 9 asked, "What type of microcomputer inservice training or staff development is provided for personnel in these school districts according to the following ADA ranges: 0 to 999, 1,000 to 2,999, and 3,000 or more?" Research question 10 asked, "What type of microcomputer inservice training or staff development is provided for personnel in elementary, junior high or middle, and high schools within these school districts?" To collect data for these questions, the principals were asked how many clock hours of the following types of microcomputer training were provided the principal: computer literacy, subject matter, special software, and other types. In addition, the principals were asked how many clock hours of the following types of microcomputer training were provided for the personnel in their buildings; computer literacy, subject matter, special software, and other types.

**Microcomputer Inservice Training Provided for Principals**

Of the 279 principals who were surveyed, all responded to the question that asked how many clock hours of the following types of microcomputer training were provided for the principal: computer literacy, subject matter, special software, and other types. The data showed the number and percent of these principals and the number of hours of training in computer literacy received (Table 19) were the following: no hours, 125 (44.80 percent); 1-4 hours, 91 (32.62 percent);5-8 hours, 36 (12.93 percent); 9-24 hours, 23 (8.24 percent); and 25 or more hours, 4 (1.43 percent). The data showed the number and percent of these principals and the number of hours of training in subject matter (Table 20) were the following: no hours, 208 (74.55 percent); 1-4 hours, 46 (16.49 percent); 5-8 hours, 22 (7.89 percent); 9-24 hours, 3 (1.08 percent); and 25 or more hours, 0 (0.00 percent). In addition, the data showed the number and

percent of principals and the number of hours of training received in special software (Table 43) were the following: no hours, 196 (70.25 percent); 1-4 hours, 58 (20.79 percent); 5-8 hours, 21 (7.53 percent); 9-24 hours, 4 (1.43 percent); and 25 or more hours, 0 (0.00 percent).

**Table 19**
**Number of Hours of Microcomputer Training in Computer Literacy Received by Principals According to Levels of Schools**

| Number of clock hours | Elementary | | Middle | | High School | | Total | |
|---|---|---|---|---|---|---|---|---|
| | N | % | N | % | N | % | N | % |
| No hours | 68 | 45.33 | 22 | 40.74 | 32 | 47.76 | 125 | 44.80 |
| 1-4 hours | 41 | 27.33 | 24 | 44.44 | 23 | 34.33 | 91 | 32.62 |
| 5-8 hours | 20 | 13.33 | 6 | 11.11 | 9 | 13.43 | 36 | 12.90 |
| 9-24 hours | 19 | 12.67 | 2 | 3.70 | 2 | 2.99 | 23 | 8.24 |
| 25 or more hours | 2 | 1.33 | 0 | 0.00 | 1 | 1.49 | 4 | 1.43 |
| Total principals | 150 | 53.76 | 54 | 19.35 | 67 | 24.01 | 279 | 100.00 |

**Table 20**
**Number of Hours of Microcomputer Training in Special Software Received by Principals According to Levels of Schools**

| Number of clock hours | Elementary | | Middle | | High School | | Total | |
|---|---|---|---|---|---|---|---|---|
| | N | % | N | % | N | % | N | % |
| No hours | 110 | 73.33 | 33 | 61.11 | 46 | 68.66 | 196 | 70.25 |
| 1-4 hours | 26 | 17.33 | 18 | 33.33 | 13 | 19.40 | 58 | 20.79 |
| 5-8 hours | 12 | 8.00 | 3 | 5.56 | 6 | 8.96 | 21 | 7.52 |
| 9-24 hours | 2 | 1.33 | 0 | 0.00 | 2 | 2.99 | 4 | 1.43 |
| 25 or more hours | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| Total principals | 150 | 53.76 | 54 | 19.35 | 67 | 24.01 | 279 | 100.00 |

**Microcomputer Inservice Training Provided for Personnel**

Of the 279 principals who were surveyed, all responded to the question that asked how many clock hours of the following types of microcomputer training were provided for the personnel in the building: computer literacy, subject matter, special software, and other types. The data showed the number and percent of the personnel and the number of hours of training in computer literacy they received (Tabel 21) were the following: no hours, 134 (48.03 percent); 1-4 hours, 81 (29.03 percent); 5-8 hours, 20 (7117 percent); 9-24 hours, 33 (11.83 percent); and 25 or more hours, 11 (3.94 percent). The data showed the number and percent of the personnel

and the number of hours of training in subject matter (Table 22 ) were the following: no hours 203 (72.76 percent); 1-4 hours, 46 (16.49 percent); 5-8 hours, 14 (5.02 percent); 9-24 hours, 10 (3.58 percent); and 25 or more hours, 6 (2.13 percent).

**Table 21**
**Number of Hours of Microcomputer Training in Computer Literacy Received by Personnel According to Levels of Schools**

| Number of clock hours | Elementary | | Middle | | High School | | Total | |
|---|---|---|---|---|---|---|---|---|
| | N | % | N | % | N | % | N | % |
| No hours | 75 | 50.00 | 24 | 44.44 | 30 | 44.78 | 134 | 48.03 |
| 1-4 hours | 36 | 24.00 | 18 | 33.33 | 24 | 35.82 | 81 | 29.03 |
| 5-8 hours | 12 | 8.00 | 3 | 5.56 | 5 | 7.46 | 20 | 7.17 |
| 9-24 hours | 20 | 13.33 | 7 | 12.96 | 6 | 8.96 | 33 | 11.83 |
| 25 or more hours | 7 | 4.67 | 2 | 3.70 | 2 | 2.99 | 11 | 3.94 |
| Total principals | 150 | 53.76 | 54 | 19.35 | 67 | 24.01 | 279 | 100.00 |

**Table 22**
**Number of Hours of Microcomputer Training in Special Software Received by Personnel According to Levels of Schools**

| Number of clock hours | Elementary | | Middle | | High School | | Total | |
|---|---|---|---|---|---|---|---|---|
| | N | % | N | % | N | % | N | % |
| No hours | 109 | 72.67 | 34 | 62.96 | 45 | 67.16 | 194 | 69.53 |
| 1-4 hours | 27 | 18.00 | 14 | 25.93 | 13 | 19.40 | 56 | 20.07 |
| 5-8 hours | 8 | 5.33 | 1 | 1.85 | 5 | 7.46 | 14 | 5.02 |
| 9-24 hours | 4 | 2.67 | 5 | 9.26 | 3 | 4.48 | 12 | 4.30 |
| 25 or more hours | 2 | 1.33 | 0 | 0.00 | 1 | 1.49 | 3 | 1.08 |
| Total principals | 150 | 53.76 | 54 | 19.35 | 67 | 24.01 | 279 | 100.00 |

**Staff Development (Inservice Training) Needed**

Research question 11 asked, "What type of microcomputer training is needed by personnel in these school districts according to the following ADA ranges: 0 to 999, 1,000 to 2,999, and 3,000 or more?" Research question 12 asked, "What type of microcomputer training is needed by school personnel in elementary, junior high or middle, and high schools within these school districts?"

**Additional Microcomputer Inservice Training Needed for Principals**

Of the 279 principals who were surveyed, all responded to the question that asked how many additional clock hours of the following types of microcomputer training should be provided for the principal: computer literacy, subject matter, special software, and other types. The data showed the number and percent of these principals and the number of additional hours of training in computer literacy that should be provided (Table 23) were the following: no hours, 108 (38.71 percent); 1-4 hours, 34 (12.19 percent); 5-8 hours, 57 (20.43 percent); 9-24 hours, 47 (16.85 percent); and 25 or more hours, 33 (11.83 percent). The data showed the number and percent of these principals and the number of additional hours of training that should be provided in subject matter (Table 24) were the following: no hours, 115 (41.22 percent); 1-4 hours, 38 (13.62 percent); 5-8 hours, 68 (24.37 percent); 9-24 hours, 35 (12.54 percent); and 25 or more hours, 23 (8.24 percent).

**Table 23**
**Number of Additional Hours of Microcomputer Training in Computer Literacy that Should be Provided for Principals According to Levels of Schools**

| Number of clock hours | Elementary | | Middle | | High School | | Total | |
|---|---|---|---|---|---|---|---|---|
| | N | % | N | % | N | % | N | % |
| No hours | 60 | 40.00 | 14 | 25.93 | 30 | 44.78 | 108 | 38.71 |
| 1-4 hours | 17 | 11.33 | 7 | 12.96 | 9 | 13.43 | 34 | 12.19 |
| 5-8 hours | 31 | 20.67 | 12 | 22.22 | 12 | 17.91 | 57 | 20.43 |
| 9-24 hours | 24 | 16.00 | 13 | 24.07 | 9 | 13.43 | 47 | 16.85 |
| 25 or more hours | 18 | 12.00 | 8 | 14.81 | 7 | 10.45 | 33 | 11.83 |
| Total principals | 150 | 53.76 | 54 | 19.35 | 67 | 24.01 | 279 | 100.00 |

**Table 24**
**Number of Additional Hours of Microcomputer Training in Subject Matter that Should be Provided for Principals According to Levels of Schools**

| Number of clock hours | Elementary | | Middle | | High School | | Total | |
|---|---|---|---|---|---|---|---|---|
| | N | % | N | % | N | % | N | % |
| No hours | 71 | 47.33 | 12 | 22.22 | 28 | 41.79 | 115 | 41.22 |
| 1-4 hours | 15 | 10.00 | 10 | 18.52 | 12 | 17.91 | 38 | 13.62 |
| 5-8 hours | 33 | 22.00 | 15 | 27.78 | 18 | 26.87 | 68 | 24.37 |
| 9-24 hours | 19 | 12.67 | 10 | 18.52 | 5 | 7.46 | 35 | 12.54 |
| 25 or more hours | 12 | 8.00 | 7 | 12.96 | 4 | 5.97 | 23 | 8.24 |
| Total principals | 150 | 53.76 | 54 | 19.35 | 67 | 24.01 | 279 | 100.00 |

**Additional Microcomputer Inservice Training That Should be Provided for Personnel**

Of the 279 principals who were surveyed, all responded to the question that asked how many additional clock hours of the following types of microcomputer training should be provided for the personnel in the buildings: computer literacy, subject matter, special software, and other types. The data showed the number and percent of the personnel and the number of additional hours of training in computer literacy they should receive (Table 25) were the following: no hours, 80 (28.67 percent); 1-4 hours, 42 (15.05 percent); 5-8 hours, 73 (26.16 percent); 9-24 hours, 48 (17.20 percent); and 25 or more hours, 27 (9.68 percent).

**Table 25**
**Number of Additional Hours of Microcomputer Training in Computer Literacy that Should be Provided for Personnel According to Levels of Schools**

| Number of clock hours | Elementary | | Middle | | High School | | Total | |
|---|---|---|---|---|---|---|---|---|
| | N | % | N | % | N | % | N | % |
| No hours | 46 | 30.67 | 8 | 14.81 | 22 | 32.84 | 80 | 28.67 |
| 1-4 hours | 21 | 14.00 | 7 | 12.96 | 12 | 17.91 | 42 | 15.05 |
| 5-8 hours | 38 | 25.33 | 15 | 27.78 | 19 | 28.36 | 73 | 26.16 |
| 9-24 hours | 26 | 17.33 | 14 | 25.93 | 7 | 10.45 | 48 | 17.20 |
| 25 or more hours | 19 | 12.67 | 10 | 18.52 | 7 | 10.45 | 36 | 12.90 |
| Total principals | 150 | 53.76 | 54 | 19.35 | 67 | 24.01 | 279 | 100.00 |

**Table 26**
**Number of Additional Hours of Microcomputer Training in Subject Matter that Should be Provided for Personnel According to Levels of Schools**

| Number of clock hours | Elementary | | Middle | | High School | | Total | |
|---|---|---|---|---|---|---|---|---|
| | N | % | N | % | N | % | N | % |
| No hours | 65 | 43.33 | 9 | 16.67 | 23 | 34.33 | 99 | 35.48 |
| 1-4 hours | 22 | 14.67 | 7 | 12.96 | 14 | 20.90 | 47 | 16.85 |
| 5-8 hours | 31 | 20.67 | 17 | 31.48 | 18 | 26.87 | 67 | 24.01 |
| 9-24 hours | 19 | 12.67 | 13 | 24.07 | 6 | 8.96 | 39 | 13.98 |
| 25 or more hours | 13 | 8.67 | 8 | 14.81 | 6 | 8.96 | 27 | 9.68 |
| Total principals | 150 | 53.76 | 54 | 19.35 | 67 | 24.01 | 279 | 100.00 |

**Summary**

The data presented in Chapter 3 were gathered from the ETSSC Microcomputer Survey Instrument (Appendix B, which was completed and returned by 279 (66.11 percent) of the 422 principals within the ETSSC. Chapter 4 will present a summary of findings, conclusions, recommendations, and recommendations for further study.

## Chapter 4

# SUMMARY OF FINDINGS, CONCLUSIONS, RECOMMENDATIONS, AND RECOMMENDATIONS FOR FURTHER RESEARCH

The primary purpose of this study was to present a description related to microcomputers in schools within the East Texas School Study Council (ETSSC) in the following categories: hardware and software available, uses, funding, literacy, training provided, and additional training needed. Also considered were the average daily attendance (ADA) ranges and the levels of the schools. Data for the study were collected with a questionnaire from a population of 422 principals within the ETSSC. Of the 279 instruments that were returned, 60 were from schools within the ADA range from 0 to 999, 82 from schools within the ADA range from 1,000 to 2,999, and 137 from schools within the ADA range of 3,000 and above. In addition, 150 survey instruments were returned from elementary schools, 54 from junior high or middle schools, and 67 from high schools.

Frequency and percentages were used to describe the results of the survey. The frequency and percentages were given for the overall results, by each ADA range, and by each level of school.

## Summary of Findings

The data were analyzed in regard to the twelve research questions used in this study. The summary of findings is presented in response to the research questions which asked for information in six areas by size of school and level of school. The first of the paired questions looked at size and the second by level of school.

1. Research question 1 asked for types of microcomputer hardware and software available in schools within the East Texas School Study Council (ETSSC) according to the following average daily attendance (ADA) ranges: 0 to 999, 1,000 to 2,999, and 3,000 and above. Research question 2 asked for types of microcomputer hardware and software available in elementary, junior high or middle, and high schools within these schools. The data revealed that all ADA ranges and levels of schools had various types of microcomputers. The Apple II was the most frequently reported microcomputer; floppy diskettes were the most used storage device; and a printer was the most frequently reported peripheral device. The primary source of microcomputer software was from a computer vendor; the software was usually rated very good or acceptable; most software was selected by the teacher or the teacher and principal; and the software selected usually supported the goals and objectives of the school building or district.

2. Research questions 3 and 4 asked how microcomputers were used by personnel in schools within the ETSSC. Microcomputers were used by less than 40 percent of the principals; microcomputers were used mostly for computer literacy and drill and practice, especially in math; the instructional arrangement most commonly used was the classroom; and microcomputers were scheduled mostly in a self-contained room or in a lab setting.

3. Research questions 5 and 6 asked what methods of funding were used to acquire microcomputers in schools within the ETSSC. The most frequently used sources of funding were local, 71.57 percent; compensatory, 24.51 percent; Parent Teacher Organization/Parent Teacher association, 16.67 percent; and campus activity funds, 15.69 percent. In addition, in most of the schools, from 0 to 5 percent of the equipment budget was spent for microcomputers, and over 98.33 percent of the schools that had microcomputers had purchased them.

4. Research questions 7 and 8 asked for the degree of microcomputer literacy of personnel in schools within the ETSSC according to size and level of the school. Less that 25 percent of the principals or their staff in the 0 to 999 ADA range used a microcomputer; and one-half of the principals or their staff in the 3,000 and above ADA range used a microcomputer. Just over one-half (48.75 percent) of the principals or their office staff had used a microcomputer; less than 18 percent of the elementary principals or their staff used a microcomputer, and nearly one-half of the high school principals or their staff used a microcomputer. In addition, less than one-third of the principals (30.47 percent) had taken a college class related to microcomputers; and in nearly one-half (47.87 percent) of the schools, none of the personnel had taken any microcomputer courses.

5. Research questions 9 and 10 asked what type of microcomputer inservice training or staff development was provided for personnel in the schools within the ETSSC according to the size

and level of school. Over 44 percent of the principals received no training; and 32.62 percent received one to four hours of training in computer literacy. In addition, most (74.55 percent) of the principals received no inservice training in subject matter and 70.25 percent received no inservice training in special software. Nearly one-half (48.03 percent) of the personnel received no inservice training in computer literacy; 72.76 percent received no training in subject matter; and 69.53 percent received no training in special software.

6. Research questions 11 and 12 asked what type of microcomputer inservice training or staff development is needed for personnel in ETSSC schools. Over 60 percent of the principals indicated additional hours of training should be provided in computer literacy for principals. In addition, 58.78 percent of the principals indicated additional training should be provided in subject matter, and over 63 percent indicated training was needed in the area of special software for the principals. Over 70 percent of the principals indicated additional training should be provided for personnel in computer literacy, and almost 65 percent said training was needed for both subject matter and software.

## Conclusions

The results of this investigation supported the following conclusions related to microcomputers in schools within the ETSSC:

1. Microcomputers, peripheral equipment, and software are available in all ADA ranges and levels of schools.
2. The personnel in schools with microcomputers apparently consider microcomputers a long-term investment and not a passing fad.
3. Microcomputer software is usually selected by the teacher or by the teacher and the principal.
4. The majority of principals do not use a microcomputer.
5. The principals and building personnel who use microcomputers use them for a variety of purposes.
6. Microcomputers are used in a variety of instructional programs.
7. Mathematics teachers may be more microcomputer literate than other building personnel.
8. The use of microcomputers in the schools has not yet reached a high level of sophistication.
9. Since three of the four most frequently used funding sources for the purchase of microcomputers are locally generated, school districts with more local resources may have a higher ratio of microcomputers per student than districts with fewer local resources.
10. The principals and their staffs in the larger school districts are more microcomputer literate than the principals and their staffs in smaller school districts.
11. High school principals appear to be more computer literate than middle school and elementary school principals.
12. More duties usually assigned to high school principals appear to be accomplished with the use of microcomputers than the duties usually assigned to elementary school principals.
13. The majority of principals and personnel do not appear to be microcomputer literate.
14. Principals and teachers have received about the same amount of microcomputer inservice training.
15. Principals and building personnel are better trained in computer literacy than in instructional subject matter or special software.
16. Additional microcomputer training is needed for principals and building personnel.
17. Since principals indicated that building personnel should receive more additional microcomputer training that the principals, apparently principals expect building personnel to be more microcomputer literate than principals.

## Recommendations

Based on the findings and conclusions of this study, the following recommendations are made:

1. The results of this study should be considered by the schools within the East Texas School Study Council (ETSSC) for future decisions related to microcomputers, such as for staff development, inservice training, or purchase.

2. Colleges and universities in the ETSSC area should consider modification of undergraduate and graduate education and administrative courses to include microcomputer literacy training.

3. An agency of the state, such as the Texas Education Agency, should assume a leadership role in the acquisition of microcomputers, software, and peripheral equipment. In addition, curriculum development, computer literacy, and a coordinated effort to integrate microcomputers into the schools should become a priority.

4. Microcomputers should be considered another tool for use in schools, not to be feared or to ba a panacea to solve all problems.

5. Software should be selected based on the goals and objectives of the school district and building.

6. Microcomputers should be selected based on the educational or management goals and objectives of the school district and building and also based on the software available that will support those goals and objectives.

**Recommendations for Further Research**

1. This study should be replicated withing one or two years due to the rapidly changing situation related to microcomputers.

2. A similar study should be considered by the Educational Service Centers in order to provide assistance related to microcomputers to the school districts within their regions.

3. A similar study should be conducted throughout the United States.

4. Model or demonstration schools should be identified, and the methods and techniques that have been successful within these schools should be considered for use in other schools.

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